

**DRAFT**

**HEALTH ADVISORY:**

**FISH CONSUMPTION GUIDELINES  
FOR LAKE NATOMA  
AND  
THE LOWER AMERICAN RIVER  
(SACRAMENTO COUNTY)**

**Pesticide and Environmental Toxicology Section  
Office of Environmental Health Hazard Assessment  
California Environmental Protection Agency**

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## EXECUTIVE SUMMARY

The United States Geological Survey (USGS) and the University of California at Davis (UCD) conducted a reconnaissance survey of mercury contamination in edible fish tissue from Lake Natoma, an area possibly affected by historic gold mining. Samples of 11 sport fish species were collected from the lake and analyzed for mercury content. These data were evaluated by the Office of Environmental Health Hazard Assessment (OEHHA), together with fish samples previously collected from the lower American River by the Toxic Substances Monitoring Program (TSMP) and the Sacramento River Watershed Program (SRWP), in an effort to determine whether there may be potential adverse health effects associated with consuming sport fish from these water bodies.

More than 95 percent of the mercury found in fish occurs as methylmercury, which is a highly toxic form of the element. Consumption of fish is the major route of exposure to methylmercury in the United States. The critical target of methylmercury toxicity is the nervous system, particularly in developing organisms such as the fetus and young children. Significant methylmercury toxicity can occur to the fetus during pregnancy even in the absence of symptoms in the mother. In 1985, the United States Environmental Protection Agency (U.S. EPA) set a reference dose (RfD, that is the daily exposure likely to be without significant risk of deleterious effects during a lifetime) for methylmercury of  $3 \times 10^{-4}$  mg/kg-day, based on central nervous system effects (ataxia and paresthesia) in adults. In 1995, and confirmed in 2001, this RfD was lowered to  $1 \times 10^{-4}$  mg/kg-day, based on developmental neurologic abnormalities in infants exposed *in utero*, using the Iraqi and Faroe Island data, respectively. Because OEHHA finds convincing evidence that the fetus is more sensitive than adults to the neurotoxic effects of mercury, but also recognizes that fish can play an important role in a healthy diet, OEHHA chooses to use both the current and previous U.S. EPA reference doses for two distinct population groups. In this advisory, the current RfD based on effects in infants will be used for women of childbearing age and children aged 17 and younger. The previous RfD, based on effects in adults, will be used for women beyond their childbearing years and men.

Mercury concentrations in fish from Lake Natoma and the lower American River (downstream from Lake Natoma to Discovery Park) were compared to guidance tissue levels for methylmercury, which are designed so that individuals consuming no more than a preset number of meals should not exceed the RfD for this chemical (see Table 2). Although Lake Natoma and the lower American River are separate water bodies, fish species and fish mercury levels in the two water bodies were sufficiently similar to justify the issuance of unified advice to facilitate public communication. After combining data for the two sites, a statistically representative sample size was available to set consumption guidelines for channel catfish, white catfish, largemouth bass, pikeminnow, sucker, redear sunfish, and bluegill; supporting data (such as contamination data for a closely related species at a similar trophic level) were used to develop additional consumption guidelines for other sport fish. When supporting data were not available for a particular species, the U.S. EPA national sport fish consumption advice for local waters for pregnant or nursing women and young children was provided for these sensitive

populations. OEHHA recommends that children through age 17 also follow this advice because of continued nervous system development through adolescence. Additionally, OEHHA recommends that women beyond their childbearing years and men follow the OEHHA general advice to limit consumption of all other sport fish species, combined, to no more than 12 meals per month.

Evaluation of data and comparison with guidance tissue levels for methylmercury indicated that development of fish consumption advisories was appropriate for Lake Natoma and the lower American River. Consumers should be informed of the potential hazards from eating fish from these water bodies, particularly those hazards relating to the developing fetus and children. All individuals, especially women of childbearing age and children aged 17 and younger, are advised to limit their fish consumption to reduce methylmercury ingestion to a level as close to the reference dose as possible. To help sport fish consumers achieve this goal, OEHHA has developed advisories for all black bass species (largemouth, smallmouth and spotted bass), channel catfish, white catfish, pikeminnow, sucker, bluegill, and sunfish species. For fish species not included in this evaluation, but potentially found in these water bodies (e.g., trout and crappie), OEHHA provides additional guidelines for women beyond their childbearing years and men as well as women of childbearing age and children aged 17 and younger. These advisories and additional guidelines are contained in this report. Meal sizes should be adjusted to body weight as described in the advisory table.

For general advice on how to limit your exposure to chemical contaminants in sport fish (e.g., eating smaller fish of legal size), as well as fact sheet on methylmercury in sport fish, see the California Sport Fish Consumption Advisories (<http://www.oehha.ca.gov/fish.html>) and Appendix 1. Site specific advice for other California water bodies can be found online at: [http://www.oehha.ca.gov/fish/so\\_cal/index.html](http://www.oehha.ca.gov/fish/so_cal/index.html). It should be noted that, unlike the case for many organic contaminants, various cooking and cleaning techniques will not reduce the methylmercury content of fish.

## HEALTH ADVISORY

Fish are nutritious, providing a good source of protein and other nutrients, and are recommended as part of a healthy, balanced diet. As with many other kinds of food, however, it is prudent to consume fish in moderation and to make informed choices about which fish are safe to eat. OEHHA provides this consumption advice to the public so that people can continue to eat fish without putting their health at risk.

LAKE NATOMA AND THE LOWER AMERICAN RIVER FISH CONSUMPTION GUIDELINES		
WOMEN OF CHILDBEARING AGE AND CHILDREN AGED 17 YEARS AND YOUNGER EAT NO MORE THAN:		
DO NOT EAT	ONCE A MONTH	ONCE A WEEK
Channel Catfish	White Catfish All Bass Pikeminnow Sucker	Bluegill Sunfish Other Sport Fish Species
WOMEN BEYOND CHILDBEARING AGE AND MEN EAT NO MORE THAN:		
ONCE A MONTH	ONCE A WEEK	3 TIMES A WEEK
Channel Catfish All Bass	White Catfish Pikeminnow Sucker	Bluegill Sunfish Other Sport Fish Species
EAT SMALLER FISH OF LEGAL SIZE. Fish accumulate mercury as they grow.		
DO NOT COMBINE FISH CONSUMPTION ADVICE. If you eat multiple species or catch fish from more than one area, the recommended guidelines for different species and locations should not be combined. For example, if you eat a meal of fish from the one meal per month category, you should not eat another fish species containing mercury for at least one month.		

**CONSIDER YOUR TOTAL FISH CONSUMPTION.** Fish from many sources (including stores and restaurants) can contain elevated levels of mercury and other contaminants. If you eat fish with lower contaminant levels (including commercial fish) you can safely eat more fish. The American Heart Association recommends that healthy adults eat at least two servings of fish per week. Shrimp, king crab, scallops, farmed catfish, wild salmon, oysters, tilapia, flounder, and sole generally contain some of the lowest mercury levels.

Meal size is assumed to be 8 ounces for a 154 pound adult. If you weigh more or less than 154 pounds, add or subtract 1 oz to your meal size, respectively, for each 20 pound difference in body weight. If you do not eat a full portion size, you can eat more than the number of recommended meals and stay within the health guidelines. For example, if you eat half the recommended portion size you can double the number of meals that you consume.

# LAKE NATOMA AND THE LOWER AMERICAN RIVER SPORT FISH

**Bluegill** (*Lepomis macrochirus*)



Duane Raver, USFWS

**Channel Catfish** (*Ictalurus punctatus*)



Duane Raver, USFWS

**Green Sunfish** (*Lepomis cyanellus*)



Duane Raver, USFWS

**Largemouth Bass** (*Micropterus salmoides*)



Duane Raver, USFWS

**Sacramento Pikeminnow** (*Ptychocheilus grandis*)



Rene' Reyes, USBR

**Sacramento Sucker** (*Catostomus occidentalis*)



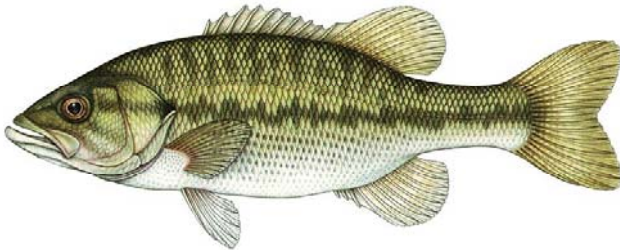
Rene' Reyes, USBR

**Redear Sunfish** (*Lepomis microlophus*)



Duane Raver, USFWS

**Spotted Bass** (*Micropterus punctulatus*)



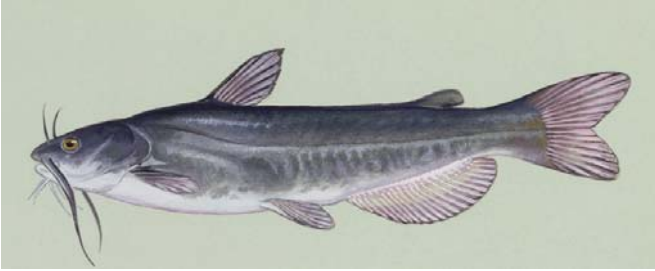
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**Striped Bass** (*Morone saxatilis*)



Duane Raver, USFWS

**White catfish** (*Ameiurus catus*)



Duane Raver, USFWS

**Note: Pictures are not to scale**